

# COMPUTER GAMES AND SIMULATION DESIGN (CGSD)

## CGSD 120, INTRODUCTION TO COMPUTER GAMES & SIMULATIONS 3 (4)

This is a basic course for students interested in designing, programming and developing computer games and simulations. Topics will include basic game/simulation design, programming and development, as well as the role of the game/simulation designer, programmer and developer. Students will be introduced to programming using a Game Engine. The students will use provided or leverage their own created assets and create a small introductory game or games using existing Game Engine software. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1, IN2, IN4

**Typically Offered:** Fall and Spring Semesters

## CGSD 121, 2D GAME PROGRAMMING 3 (4)

This is a basic course for students interested in designing, programming and developing computer 2D games using a Game Engine. This course will build on CGSD 120 adding program scripting and programming concepts, as well as the roles of the game/simulation designer, programmer and developer. The students will use provided or leverage their own created assets and create small introductory games using Torque, a commercial Game Engine. Laboratory required. (A special fee will be assessed.) Prerequisite: CGSD 120 and CMPR 166 or divisional approval.

**General Education:** IN1, IN2

**Course Entry Requirement(s):** Prerequisite: CGSD 120 and CMPR 166

**Typically Offered:** Spring Semester

## CGSD 125, FLASH FOR GAMES AND SIMULATIONS 3 (4)

A course of Flash with ActionScript 3.0 for game and simulation programming that includes: creating visual objects, using events to accept user input, animating the interactions between the visual object based on the user interaction and the program script, developing and debugging programs, accessing external data and publishing the game/simulation. Examples are used throughout the course. Laboratory required. (A special fee will be assessed.) Prerequisite: CMPR 166 and MTHM 171 or divisional approval.

**General Education:** IN1

**Course Entry Requirement(s):** Prerequisite: CMPR 166 and MTHM 171 or divisional approval.

**Typically Offered:** Spring Semester

## CGSD 130, GAME APPLICATIONS FOR EMERGENT PLATFORMS 3 (4)

This is a course for programming games and simulations on Android and iOS devices. Students in the course will learn how to use visual objects for the above mentioned mobile platforms. In this course, visual objects will be made to move according to different gravity or elasticity of game or simulation environment (bounce, rotations, translations, acceleration). The sensors of the mobile device (i.e. accelerometer and magnetometer) will constitute an input for some of these visual object movements. The course assumes that students know general programming concepts learned from the pre-requisites. Students will spend time utilizing both PC/Android and Mac/iOS devices. An Android tablet, an Android smartphone, an iPad2 and iPhone will be available for testing during class. The mobile devices are not required from the students in order to take the course.

**General Education:** IN1, IN2

**Course Entry Requirement(s):** Prerequisite: CMPR 166; Corequisite: MTHM 171

**Typically Offered:** Fall Semester

## CGSD 221, 3D GAME PROGRAMMING 3 (4)

This is a course for students interested in designing, programming and developing computer 3D games using a Game Engine. This course will build on CGSD 121 adding game engine development and graphics and gaming concepts. The students will use provided or leverage their own created assets and create small introductory games using a commercial Game Engine. Laboratory required. (A special fee will be assessed.)

Prerequisite: CGSD 121 and CGSD 272 or divisional approval.

**General Education:** IN1, IN2

**Course Entry Requirement(s):** Prerequisite: CGSD 121 and CGSD 272 and previous or concurrent enrollment in CMPR 168 or divisional approval

**Typically Offered:** Fall Semester

## CGSD 222, 3D GAME LEVEL DESIGN 3 (5)

This course covers computer game level design. Students learn the techniques used in creating level designs for games including creation and optimization of the terrain map, structure design, lighting, triggers of game code, texturing and shadowing. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1, IN2

**Course Entry Requirement(s):** Prerequisite: CGSD 121 or divisional approval

**Typically Offered:** Spring Semester

## CGSD 223, SERIOUS GAMES AND SIMULATIONS 3 (4)

This is a basic course for students interested in designing, programming and developing serious games and simulations. Topics will include simulation design, basic pedagogy of serious games, basic mathematical modeling, and an introduction to the creation and analysis of industrial simulations. Students will develop serious games and training simulations using a basic Game Engine, and develop industrial simulations using an industrial simulation package. Laboratory required. (A special fee will be assessed.) Prerequisite: CGSD 121 or divisional approval.

**General Education:** IN1, IN2, IN5

**Course Entry Requirement(s):** Prerequisite: CGSD 121 or divisional approval

**Typically Offered:** Spring Semester

## CGSD 225, ADVANCED GAME PROGRAMMING 3 (5)

This is an advanced course for students interested in programming and developing computer games. Topics presented in this course prepare students to modify a Game Engine, enhance a program, and add components to a commercial Game Engine with emphasis on sound engineering principles and methods. Learning experiences may include extending a Game Engine design to: enhance physics functions; simulate a networked manufacturing process; simulate electronic circuits; simulate human-machine interface engineering; simulate realistic cityscape; simulate a crime scene and other topics as appropriate. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1, IN2

**Course Entry Requirement(s):** Prerequisite: CGSD 221 or CMNW 221 or divisional approval

**Typically Offered:** Spring Semester

**CGSD 271, DIGITAL IMAGING 3 (6)**

An introduction to the use of raster and vector-based digital tools in the acquisition, manipulation, and production of image-based visual art for traditional and new media applications. Students will gain hands-on experience with industry-standard hardware and software tools for the production of both screen-based (internet, mobile, and gaming) as well as print-based (design, fine arts) imaging contexts involving creative expression. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1, IN2

**Typically Offered:** Spring Semester

**CGSD 272, DIGITAL ILLUSTRATION 3 (6)**

A focus on communication ideas through visual expression using vector-based software applications. Course emphasis is on concept art development for narrative and conceptual themes; including animation, comic books, gaming, children's books, and product design. Students will be expected to engage in the exploration of technique, creative process and the development of personal styles while meeting strict deadlines. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1, IN2

**Typically Offered:** Spring Semester

**CGSD 276, 3-D MODELING AND ANIMATIONS 3 (6)**

This class is an exploration of three dimensional modeling and animation. Students will be introduced to select software that produce vector and fractal based objects. The computer will be used to create and/or modify primitives, apply surface textures, control lighting, and camera position. The students will learn how to animate the resulting objects and create environments. The class will expand their understanding of the computer's potential as a creative tool. (A special fee will be assessed.)

**General Education:** IN1, IN2

**Typically Offered:** Fall and Spring Semesters